

Application of Geophysical and Geotechnical Methods to Determine the Geotechnical Characteristics of a Reclaimed Land

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Abstract

Near-surface seismic refraction method and electrical resistivity methods were used to characterise the subsurface of a site reclaimed from water bodies, in order to determine the depth to the most competent layer for construction purposes. Nine seismic refraction profiles were surveyed and the data was interpreted using SeisImager software package. Also, twelve vertical electrical soundings were carried out and the acquired data was interpreted using WinResist computer package. The seismic refraction method delineated three layers while the electrical resistivity method revealed between four and five geoelectric layers. The result of the seismic refraction method showed that the third layer is the most competent layer having the highest elastic moduli. Furthermore, the resistivity method revealed that the third geoelectric layer is the most competent having resistivity ranging between 23.3 and 1107.2 Ωm . It was also discovered that the depth to the most competent layer is between 7 m and 18 m in the subsurface. It was concluded that piling will be the most appropriate foundation for any building in the study area.